REMARKS

This responds to the Office Action mailed on May 19, 2005.

Claims 1-62 are now pending in this application.

Claim Objections

Claims 27, 28, 29 and 30 were objected to under 37 C.F.R. § 1.75 as being a substantial duplicate of claims 10, 11, 12 and 13 respectively. The Office Action states that both claims 10 and 27 depend on claim 9. This is not correct. Examiner's attention is directed to the previously submitted amendment, mailed February 24, 2005. Claim 10 depends ultimately from claim 1, a method claim, and claim 27 now depends ultimately from claim 18, a computer readable medium claim. Thus, the claims objected to are not duplicates, as they depend from different independent claims. It is respectfully requested that the objection be withdrawn.

§102 Rejection of the Claims

Claims 1-62 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tong et al. This rejection is respectfully traversed, at least on the basis that each and every element of the claims is not shown by Tong et al. Specifically, Tong et al. does not deal with sparse data for the inside data as claimed.

In the response to arguments section of the Final Office Action, it is stated that Applicant clearly misunderstands and hence misinterprets Tong's terms "outside" and "inside". Tong et al. provides a clear definition of the terms in the paragraph beginning at Col. 5, line 15: "The first difference between classification and boundary determination training is that in the latter, one of the classes is artificially generated. Neural network training for classification needs competing classes of input data to make a reasonable decision boundary. However, in abnormality or novelty detection type problems there is often only one class of data, hereafter called "inside" data. Therefore, a set of "outside" class data is artificially generated to provide a competing influence to the known inside points. These "pseudo" outside data points can be initially chosen so that either they are randomly distributed within a selected region of the decision space, or they can be more specifically located as discussed below."

The use of "inside" and "outside" thus appears to refer to whether data is in a class, or out of a class, and in one particular instance, where all the known data is inside the class, the pseudo data is created to represent data outside of the class.

In the present application, an example is given of time series data that represents four different classes. The problem, is that the data in the different classes themselves may be sparse, and not contain enough data points to adequately train a neural net. This problem is very different from the one described in Tong et al., where all the data may be from a single class, and there is a lack of data outside the class.

In claim 1, the Final Office Action states on page 3 that "Claim 1's "receiving sparse data;" is anticipated by Tong et al. col. 8 line 65 "gathering inside data representative of said inside class;"" There is nothing in Tong et al. that indicates that the gathered data is sparse. In fact, Tong et al. indicates the need to generate data outside of the class, or "different from the inside data" as indicated at Col. 5, lines 54-55. Thus, Tong et al. actually teaches away from the gathered data being sparse as claimed. This difference alone is sufficient to negate a prima facie case of anticipation, and the rejection should be withdrawn.

The Final Office Action also indicates that "enriching the received data" is anticipated by Tong et al., at col. 8, line 67 – generating pseudo data. This statement is respectfully traversed. Tong et al. does not enrich the inside data, it creates pseudo data to provide data different from the inside data, as clearly stated starting at Col. 5, line 54.

In claim 1, the Final Office Action also states that claim 1's "around a deviation of the mean of received data using a predetermined distribution" is anticipated by Tong et al. col. 5, line 60. "One reasonable choice for the **initial pseudo data** is to randomly generate them within a bounding hypercube..." emphasis added, and line 66, "to provide an average even distribution." It is then stated that if the data set is even distributed, then there must be a mean and a deviation from the mean for the data set. This is respectfully traversed. The quoted language refers to the creation of pseudo data, which by definition, only includes points outside the class. This is confirmed not only by the initial sentence at Col. 5, line 54: "Next, at 120, pseudo data is generated to represent points different from the inside data.", but also by further statements in Col. 6, starting at line 14: "A modification of the randomly generated pseudo data allows retention of pseudo data points that appear to be near the boundary." Thus, the purpose of

the bounded hypercube clearly appears to be to generate points outside of the inside data. The above language of claim 1 is clearly not met by such a hypercube, which cannot result in "enriching the received data around a deviation of the mean of the received data using a predetermined distribution." The rejection should be withdrawn, as several elements are not shown.

With respect to claim 3, it has been shown that the received data, or "inside" data of Tong et al. is not sparse. Thus, Tong et al., does not check for the sparseness of the data, and further does not enrich the checked data round the deviation of the means of the received data based on the outcome of the checking as claimed.

Claims 4 and 5 similarly deal with the sparseness of the data and enhancing the sparse data, and are similarly believed to distinguish from Tong et al.

Claims 6-11 further distinguish from Tong et al. There is no identified teaching in Tong et al. of rearranging data based on class. At best, as indicated in the Final Office Action, "the method is applicable to multiple class data sets also". However, nothing is said about rearranging data based on class. Claim 7 indicates that the data is normalized based on attributes in the rearranged data. Also, nothing in Tong et al. is indicated as performing such normalization. Claim 8 describes checking each class for sparseness and enriching each class based on such check. Again, nothing in Tong et al., is indicated as performing such a function, and in fact, Tong et al. clearly teaches away from the need for any similar function, as only data outside a class is enriched. Dependent claims 12-17 further distinguish from Tong et al., continuing the class distinction, and clearly setting forth equations that are not applicable to Tong et al.

Independent claim 18 also distinguishes from Tong et al., as it is similar to claim 1 in that "only sparse data is available", the sparse data is enriched and outputted for machine learning. Again, Tong et al. does not enrich sparse data in the same manner as claim 18 in that Tong et al. deals with an adequate amount of data inside a class.

Claims 19 – 34 introduce some of the same elements as the claims which depend from claim 1, and are believed to distinguish from Tong et al. for at least the same reasons.

Independent claim 35 also enriches sparse data around a deviation of a mean for creating enriched data for unbiased machine learning. It distinguishes from Tong et al. for many of the

same reasons recited above. In addition, the term unbiased machine learning is different from Tong et al. Tong et al., actually discusses a net bias parameter at Col. 6, lines 30-43. The term also appears in claim 18.

Dependent claims 36-44 also distinguish from Tong et al. for many of the reasons cited above.

Independent claim 45, along with dependent claims 46-62 by dealing with received sparse data, enriching it around a deviation, and outputting it for unbiased learning. Many of the dependent claims further distinguish from Tong et al. for the same reasons as previously discussed dependent claims. Further, claims 58-61 introduce the concept of real time data, sampling with a predetermined window length, and dynamically varying the window length for real time data. These aspects of the claims have not been shown in Tong et al. Thus, the finality of the rejection is premature. It is requested that the rejections be withdrawn, or at a minimum, the finality withdrawn.

§112 Rejection of the Claims

Claim 62 was rejected under 35 U.S.C. § 112, second paragraph, as no database being set forth in claim45 therefore lack antecedent basis for this term. This rejection is believed addressed by the previously submitted amendment, mailed February 24, 2005.

§103 Rejection of the Claims

Claim 62 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tong et al. in view of Thyagarajan U.S. Patent Publication 20020124075 (Thyagarajan).` Since claim 62 depends from a claim which is believed allowable, the rejection should be withdrawn.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 19th day of July, 2005.

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